

GB2201184

Publication Title:

Composite self propping beam for use as a lintel when forming an opening in an existing wall

Abstract:

Abstract of GB2201184

Composite self propping beams enable an opening to be formed in a wall without the need for propping and pinning-up either side of the wall and with relatively small, lightweight and manoeuvrable parts. The propping parts 1 are arranged in line within small separate holes cut into the walling above an opening to be formed, packing shims 8 between them and the wall are provided, the prop parts are aligned by a line stretched between extra length snap off bolts 6, the beam parts 2 are then fitted into the depth and width of the prop parts 1 and the beam parts 2 are bolted 4 to the former, further packing shims 9 are then provided between the prop parts 1 and the beam parts 2 and mortar forced into the gaps between the top of the now whole composite beam and the wall, the opening below can thus be formed safely.

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(12) UK Patent Application (19) GB (11) 2 201 184 A

(43) Application published 24 Aug 1988

(21) Application No 8701787

(22) Date of filing 27 Jan 1987

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(51) INT CL
E04G 23/02

(52) Domestic classification (Edition J):

E1S 224 AW
E1D 1079 2104 402 543 905 CA
U1S 1695 1707 E1D E1S

(55) Documents cited
GB 0828221

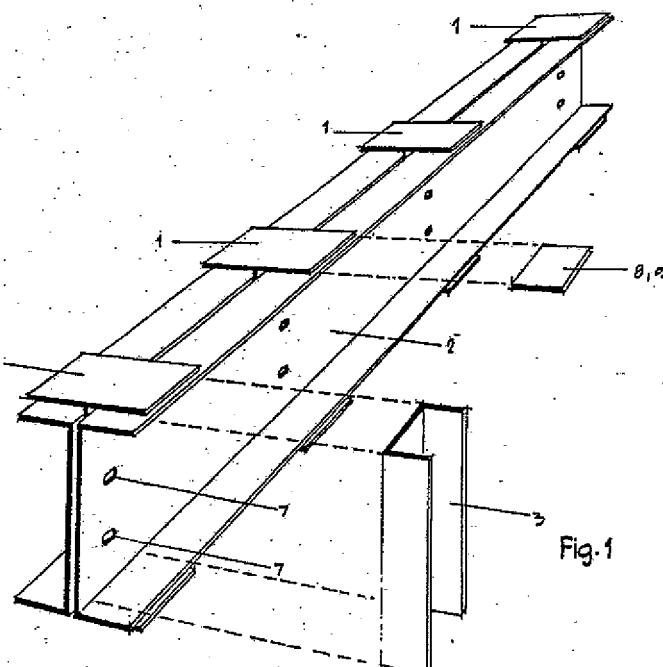
(56) Field of search

E1D
E1S
E1E
Selected US specifications from IPC sub-class.
E04G

(54) Composite self propping beam for use as a *intel* when forming an opening in an existing wall

(57) Composite self propping beams enable an opening to be formed in a wall without the need for propping and pinning-up either side of the wall and with relatively small, lightweight and manoeuvrable parts.

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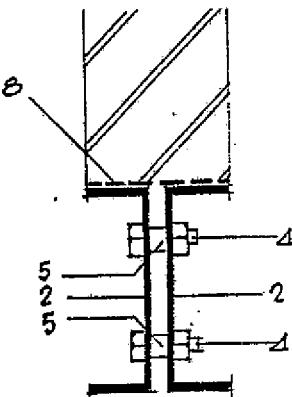
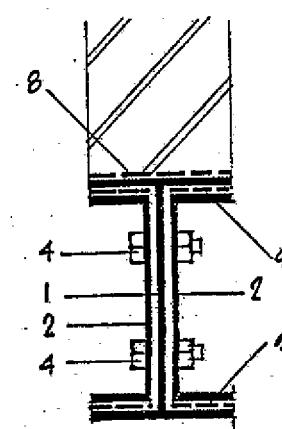
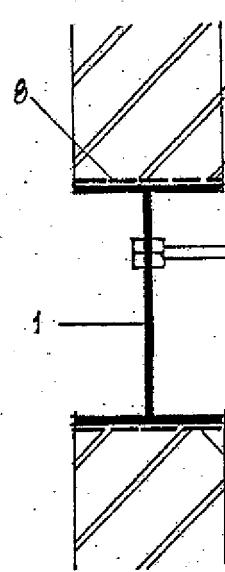
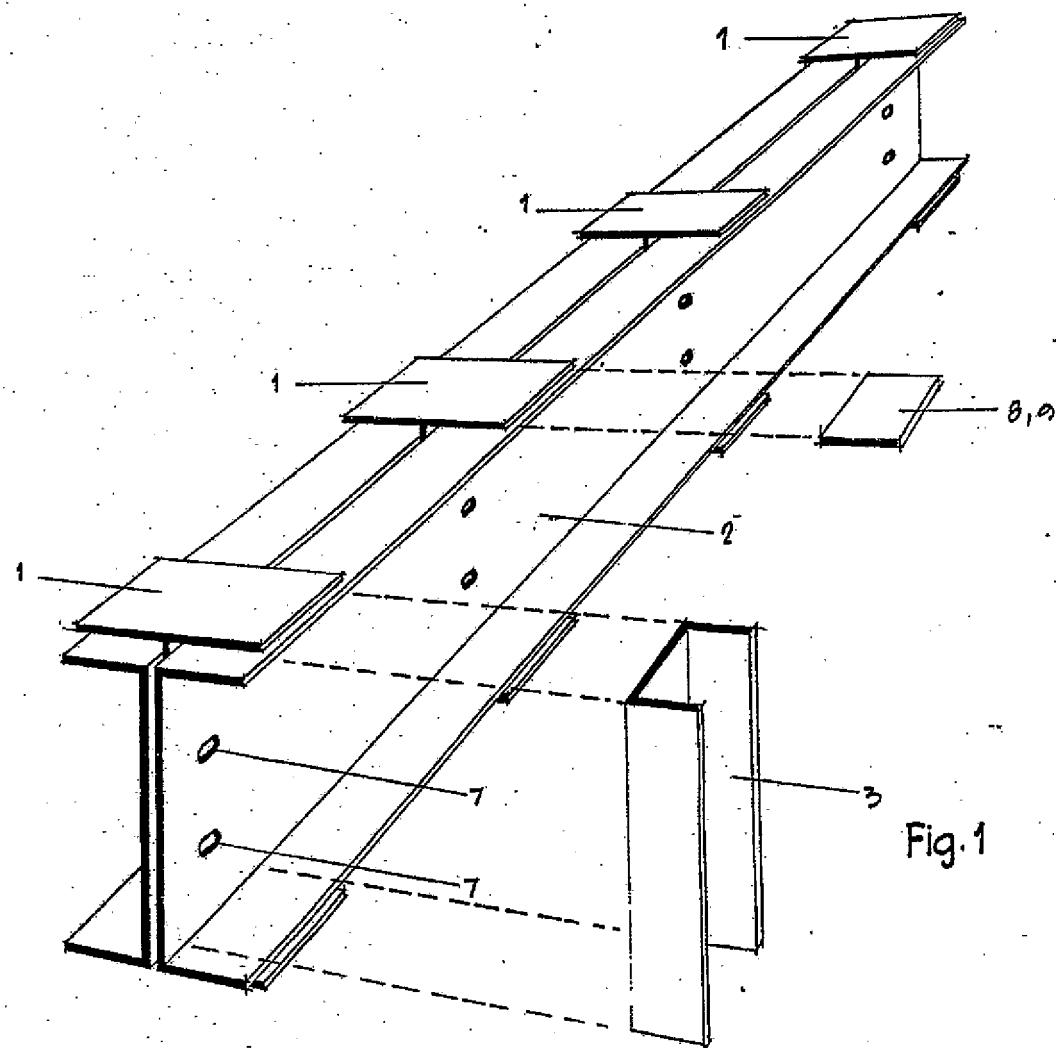


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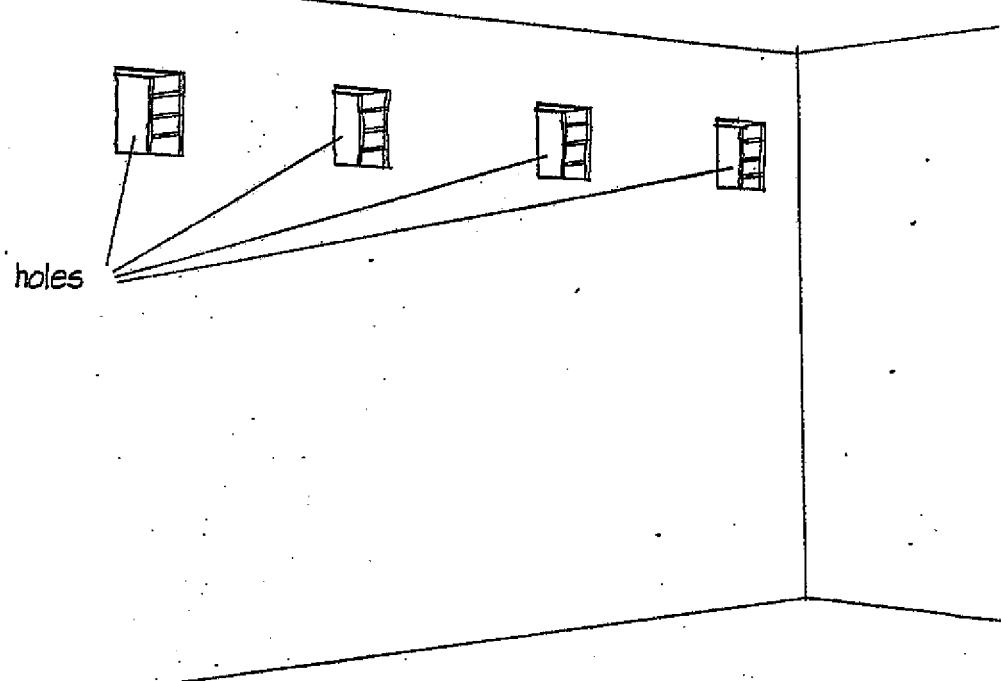


Fig. 5

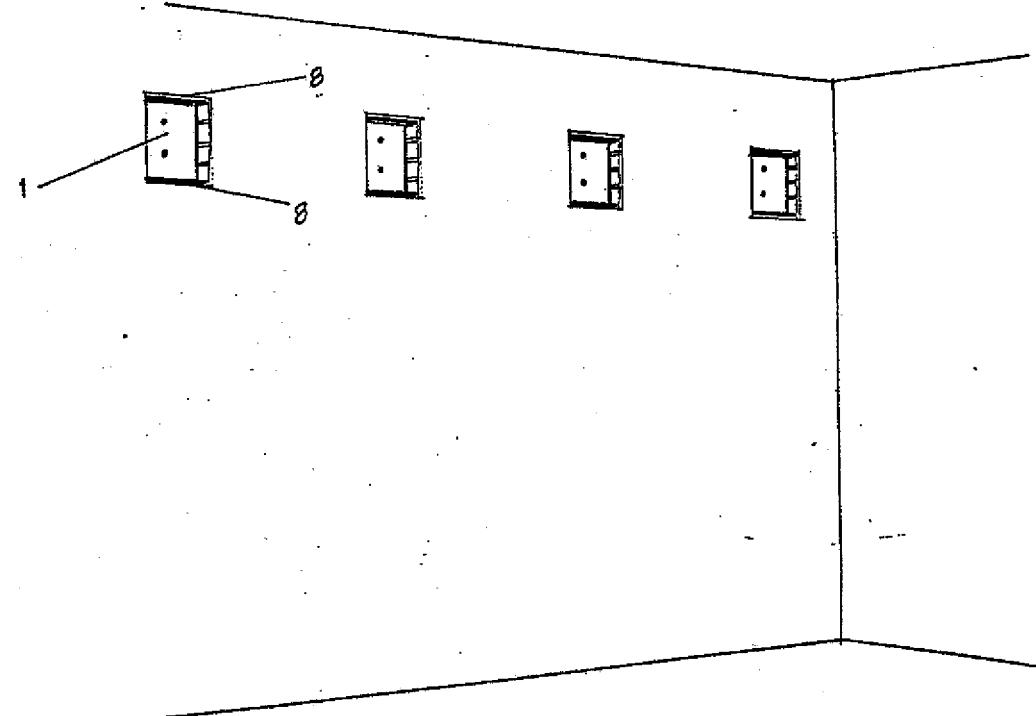


Fig. 6

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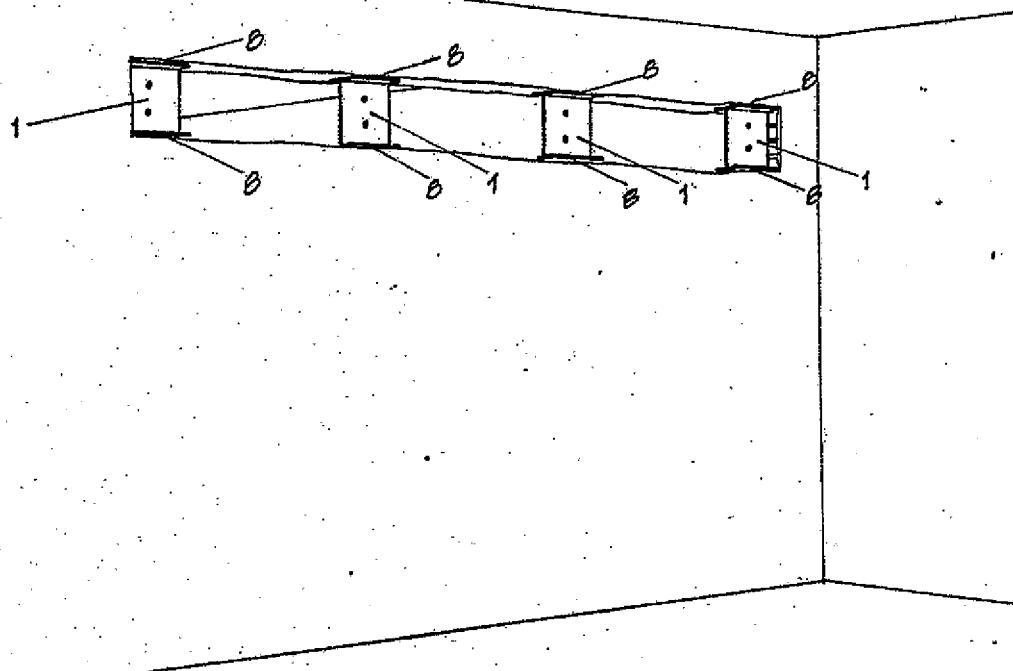


Fig. 7

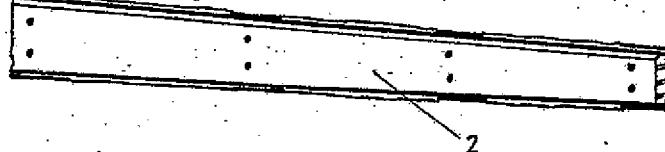


Fig. 8

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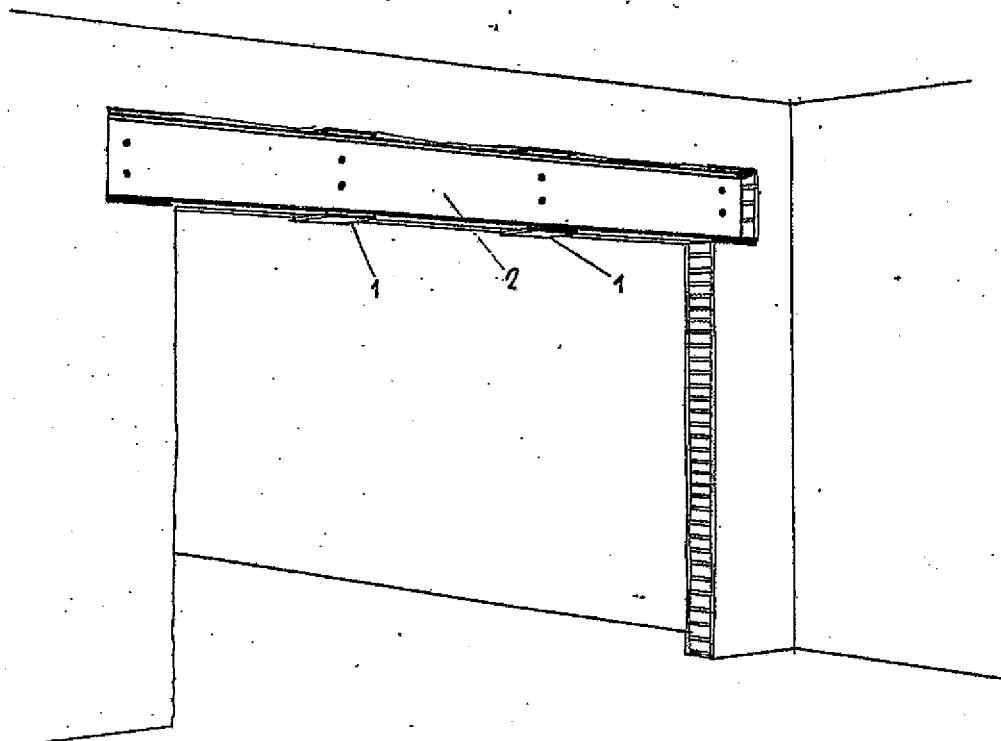


Fig. 9

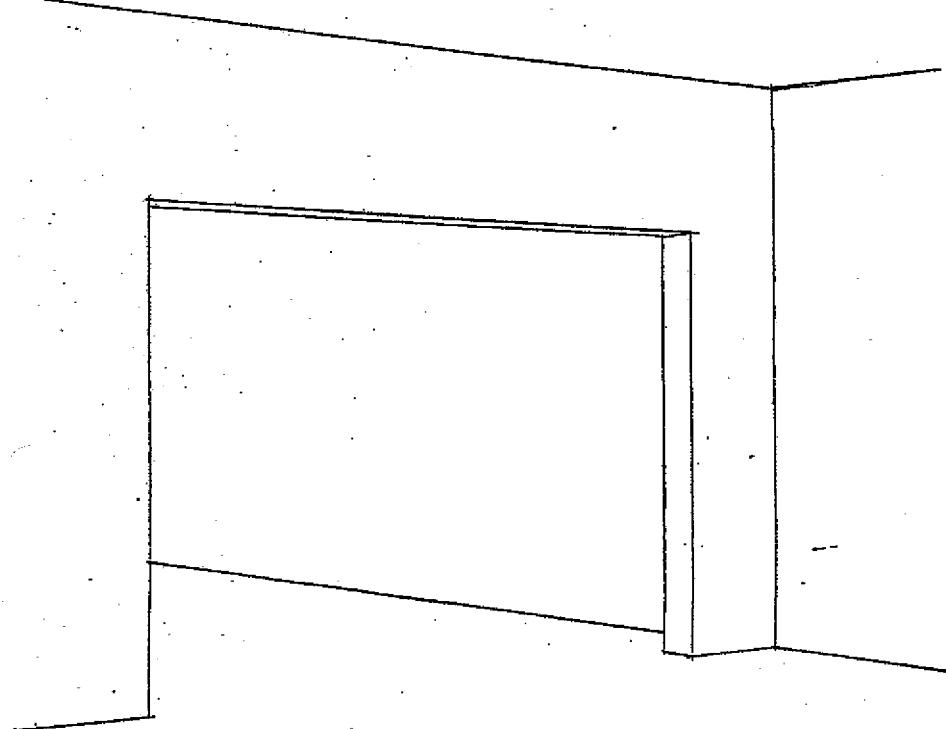


Fig. 10

AND FITTINGS

This invention relates to a composite self-propping beam and fittings that provides support to walling over an opening to be formed, without the normal necessity for propping beyond the width of the wall to be supported.

It is well known that when inserting a beam in a wall to be supported over an opening it is necessary to prop up the walling above the new beam height by a series of horizontal members penetrating the walling through holes cut above the new beam and protruding same distance beyond both faces of the wall, under the ends of these members are placed vertical supporting members that must have a sound base. This whole operation normally requires at least two persons, some experience, the hire of specialist equipment and is prone to accident and danger, it is also usual to remove as much load as possible from the wall to be propped prior to any cutting or propping.

The propping-up operation is costly, time consuming as props have to remain in position for some time after the opening is formed and the new beam inserted, it is difficult to manouvre the new beam around the props, the new beam is usually heavy and almost always too heavy for one person, is dangerous to lift and manouvre and the holes cut in the wall above the beam for the horizontal temporary props has to be made-good and the propping members returned to the hire company consuming more time, organisation and money.

According to the present invention there is provided at least one propping metal part and at least one beam part. The propping part or parts may consist of 'I' section, single channel section, back to back channel sections, or split and bent head and base flanges to form an I section shape, such sections would ideally be of short length.

The internal vertical dimension from the underside of the propping piece topmost flange to the top of its lowest flange is greater than the overall depth of the beam part, by an additional tolerance for fitting the beam part between the top and bottom flanges of the prop-part.

The beam part is a continuous length that is longer than the width of the opening to be formed in the wall beneath the beam part, this metal part may

consist of 'I' section, channel section, back to back channel section and/or box section. Means of aligning, fixing and packing is desirable. The beam part may also be of timber.

In the preferred example means of packing between the horizontal surfaces of the prop part facing the walling and the prop part facing the beam part is provided along with means or points to align the propping parts one with another and provisions made to fix the beam part to the propping parts, the beam part to another beam part and the beam part to web stiffening pieces, ultimately all parts to be fixed to form one composite self-propping beam. Web stiffening pieces would be extra in cases requiring additional strength. It may be of benefit to provide holes or slots within the prop-parts, beam parts or web stiffener pieces to assist fixing and alignment of one part with another, spacer and load spread washers to bolts may of benefit.

A composite self-propping beam may be of varying width, depth, thickness of members, spacing and be placed side by side to meet differing load spans and wall widths and construction, the sides and soffits may be pre-finished to receive plaster, intumescent fire coatings or have other means of attaching finishes.

A specific embodiment of the invention will now be described by way of example with reference to the accompanying drawings which:-

- FIG 1. Shows the composite self-propping beam in perspective.
- FIG 2. Shows the propping part in section with packing shims and alignment bolts.
- FIG 3. Shows the composite self-propping beam in section at a prop position.
- FIG 4. Shows a section through the beam parts between prop positions.
- FIG 5. Shows in perspective stage 1 of the work sequence to installation ie cutting holes at intervals.
- FIG 6. Shows in perspective stage 2 of the work sequence to installation ie inserting prop-parts/alignment and wall to prop-part packing.
- FIG 7. Shows in perspective stage 3 of the work sequence to installation ie removal of walling between prop-parts.
- FIG 8. Shows in perspective stage 4 of the work sequence to installation

ie fitting beam part within prop parts and packing between beam part and prop-parts, bolting together same, packing between beam part and walling.

FIG. 9. Shows in perspective stage 5 of the work to installation ie from opening under composite self-propping beam.

FIG. 10. Shows in perspective the final finishing stage with the composite self propping beam given a fire proof finish and the opening under completed.

Referring to the drawing a composite self propping beam comprises separate propping parts 1 in the form of 'I' sections of shorter length and slightly greater depth than the continuous beam part or parts 2 which take the form of channel sections 2 fitting within the prop-parts 1. The prop parts being inserted into holes cut into the wall at intervals as in figure 5.

In order to provide any required extra strength without necessarily increasing the shape, depth, material composition or thickness of the beam part 2 web stiffening pieces 3 may be provided. The means for fixing 4 and aligning 6 and spacing/washers 5 the prop parts 1 and beam parts 2 and are fitted to be coincident. Packing shims 8/9 to fit between the prop parts 1 and walling and prop parts 1 and beam parts 2 where there may be gaps are provided in the preferred embodiment. When installation is complete the opening may be safely formed beneath the beam part with the space/gaps between the packing shims 8 along the length of the beam part or parts 2 being packed with mortar.

To aid fixing certain finishes pre-drilled holes for self tapping screws may be provided in the beam part 2 and/or prop parts 1 or other means provided for surface finishing such as a keyed surface to beam parts 2 or prop parts 1.

CLAIMS

1. A composite self-proping beam comprising a plurality of separate prop-parts of short length, their depth being slightly larger than that for the continuous beam part or parts that insert wholly or partly within the width and depth of the prop-parts when properly aligned, the prop parts and beam part or parts will ideally have means of alignment and secure fixity one to another and a tolerance of fit of the beam part within the depth of the prop part. The length of the beam part or parts will always be in excess of the opening to be formed beneath.
2. A composite self-proping beam as claimed in claim 1, which has metal prop-parts of 'I' section, channel section, back to back channel section or split and bent at right angles head and base flanges to form an 'I' shape.
3. A composite self-proping beam as claimed in claims 1 and 2 and which has metal or timber beam part or parts of 'I' section, channel section, back to back channel sections or box sections.
4. A composite self-proping beam as claimed in claims 1, 2 or 3 and which has means of alignment that is an elongated snap off bolt precisely fitted one to each prop part through a pre-drilled hole or by fixed welding, at one point along the length of the bolt is a marked point proud of the face of the relative wall to be supported, this point is aligned one bolt with another for level and face alignment of the prop pieces, a string line may be used.
5. A composite self-proping beam as claimed in claims 1, 2, 3 or 4 and which has pre-drilled holes or slots in the prop-parts, beam parts and any web stiffener pieces to enable bolts that are provided to enable positive fixity through such holes/slots using nuts, washers and spacing pieces (perhaps of tubular form) as appropriate and all to be tight fitting.

6. A composite self-propelling beam as claimed in claims 1, 2, 3, 4 and 5 which has optional web stiffener pieces of such shape as to fit tightly against the vertical and/or horizontal sections of beam parts to provide extra resistance to buckling at a prescribed point or points along the length of a beam part or parts.
7. A composite self-propelling beam as claimed in claims 1, 2, 3, 4, 5 and 6 and which has optional shims or packing pieces used to fill the gaps that can occur between the prop parts and the walling and the prop parts and beam part or parts.
8. A composite self-propelling beam as claimed in claims 1, 2, 3, 4, 5, 6 and 7 and which has a roughened outer surface or surfaces to receive finishes such as plaster or a smooth surface to receive an intumescing fire coating, alternatively the prop parts and or beam parts may have means of fixity for finishes.
9. A composite self-propelling beam substantially as described herein and with reference to figures 1-10 of the accompanying drawings.